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CENTRAL INTELLIGENCE AGENCY

REPORT

INFORMATION REPORT

CD NO.

COUNTRY East Germany

DATE DISTR.

SUBJECT VEB Synthesewerk Schwarzheide: Hydrocarbon Synthesis under Normal and Medium Pressure

NO. OF PAGES 3

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO.

SUPPLEMENT TO REPORT NO.

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1. Among the 1954 research and development projects carried out by the Research and Development of VEB Synthesewerk Schwarzheide were projects on "Experiments concerning Hydrocarbon Synthesis according to Fischer-Tropsch with Iron-Copper Contacts, under Normal and Medium Pressure". The short title of the experiment under normal pressure was "Hydrocarbon Synthesis (Normal Pressure)". Its plan number was 013509b (V-4/04). The short title of the experiment under medium pressure was "Hydrocarbon Synthesis (Medium Pressure)". The plan number was 013509b (V-4/05). Both experiments were carried out under the supervision of Chemical Technician Denker (fnu).

2. The following indications on the projects were given in the 1954 research and development report of the Schwarzheide enterprise:

a. Hydrocarbon Synthesis (Normal Pressure)

(1) Only experiments on a small technical scale were carried out. Plans to carry out experiments on a larger scale had to be cancelled since the construction of a technical CO generator was not approved.

(2) Experiments were carried out with contact layer heights of 1.5, 2.5 and 4.5 meters and with various gas speeds. These experiments resulted in yield increases (hoehere Leistungen an Raumzeitausbeute) of 10 to 50 percent. The total yield was 80 to 103 grams per normal cubic meter of synthesis gas. [redacted] of 1 to 2.

(3) Additional experiments aimed at attaining higher yield through repeated extractions, which were carried out after the model of a West German patent, resulted only in partial success.

(4) Experiments with synthesis gas with richer CO contents resulted only partially in increased yields. The synthesis gas used was CO:H_2 in the ratio of 1 to 1.2 and 1 to 1.5. These experiments, however, resulted in an increase of about 40 percent of the saturated hydrocarbon contents of the benzine fraction and in their increase from about 10

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COUNTRY East Germany

DATE DISTR. 9 June 1955

SUBJECT VEB Synthesewerk Schwarzheide: Hydrocarbon Synthesis under Normal and Medium Pressure

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and Development Department of VEB [redacted]erk Schwarzheide, were projects on "Experiments concerning Hydrocarbon Synthesis according to Fischer-Tropsch with Iron-Copper Contacts, under Normal and Medium Pressure". The short title of the experiment under normal pressure was "Hydrocarbon Synthesis (Normal Pressure)". Its plan number was 013509b(V-4/04). The short title of the experiment under medium pressure was "Hydrocarbon Synthesis (Medium Pressure)". The plan number was 013509b(V-4/05). Both experiments were carried out under the supervision of Chemical Technician Denker (fnu).

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(2) Experiments were carried out with contact layer heights of 1.5, 2.5 and 4.5 meters and with various gas speeds. These experiments resulted in yield increases (hoehere Leistungen an Raumzeitausbeute) of 10 to 50 percent. The total yield was 80 to 103 grams per normal cubic meter of synthesis gas. The temporal-spatial yield (Raumzeitausbeute) was 150 to 240 kilograms per day per cubic meter of contact. This yield approximated the performance of Co-ThO_2 contacts at normal pressure. The synthesis gas was CO:H_2 in the ratio of 1 to 2.

(3) Additional experiments aimed at attaining higher yield through repeated extractions, which were carried out after the model of a West German patent, resulted only in partial success.

(4) Experiments with synthesis gas with richer CO contents resulted only partially in increased yields. The synthesis gas used was CO:H_2 in the ratio of 1 to 1.2 and 1 to 1.5. These experiments, however, resulted in an increase of about 40 percent of the [redacted]

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to 15 percent to about 25 to 30 percent in the kogasin fraction.

(5) In addition to the standard contacts, new contacts of various compositions were used. A total of 18 experiments was carried out with them.

b. Hydrocarbon Synthesis (Medium Pressure)

(1) Semi-technical Experiments: The first semi-technical medium pressure synthesis oven for the use of iron contacts was completed during the first quarter of 1954. The reaction space of this oven is suited for about 1.1 cubic meters of contact. The length of the contact tube is 8 meters; the diameter is about 50 millimeters. There are 72 contact tubes. Water flowing around the contact tubes is used as a cooling agent. The first experiments resulted in failures due to technical faults:

(a) Originally a normal-pressure gas [redacted] built into an autoclave, was use[redacted] lauf-Foerdermittel). However, its per[redacted] to excessive contact resistance.

[redacted]

The contact was heavily dama[redacted] caused by [redacted] leakage of the [redacted]

[redacted] second and third [redacted] nts were started subsequently were carried out under [redacted] ical conditions. ed out, however, that the contact which was used first showed etory performance, but after a short operating time the performance fell off c[redacted] the causes revealed that resistance [redacted] dual contact tubes. ifficulty was [redacted] new methods of contact filling. On 1 October 1954, a [redacted] s started. This experiment resulted in a perfect technical operation and is still going on. The synthesis gas used is $CO:H_2$ in the ratio of 1 to 2 at 200 - 230° C. reaction temperature and 5.5 to 7.5 atu gas pressure. The yield was 130 to 135 grams of total product with 115 grams of primary product per normal cubic meter of synthesis gas. The spatial-temporal yield (Raumzeitausbeute) was more than 500 kilograms per day per cubic meter of contact. A parallel experiment was carried out with the same contact under the same conditons on a small technical scale. This experiment resulted in a smaller yield than that of the experiments on a semi-technical scale.

(2) Small Technical Experiments: Twenty experiments were carried out in small technical contact ovens with contact volumes from 5 to 12 liters. In some of the experiments, new contacts were used which were prepared according to recent scientific literature. In addition, standard contacts were used by means of which the pressure, gas charge, gas composition, temperature and circulation speed were varied. It was found that with the aid of the medium-pressure

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circulation method (Mitteldruck-Kreislaufverfahren) almost every gas w[redacted]ratio of 1 to 1.2 to 1 to 2 could be ideally processe[redacted] rich hydrocarbon content, through use of this metho[redacted]hite paraffin and pure unsaturated hydrocarbons. Reduction [redacted]t lowest temperatures possible is to be considered as the best wa[redacted] pre-processing. In addition, experiments were successful in producing considerable amounts of higher-molecular olefines (50 to 60 percent in diesel oil and kogasin) with a strongly alkalized contact. These higher molecular olefines are well-suited as base products for Oxo-synthesis.

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